

## SINOPIMOVIDAE, A NEW SPIDER FAMILY FROM CHINA (ARACHNIDA, ARANAEAE)

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**Abstract** The new spider family Sinopimoidae fam. nov. (Araneae, Araneoidea), with *Sinopimoa bicolor* gen. nov. et sp. nov., is described from a tropical rainforest in Southwest China.

**Key words** New taxa, rainforest, taxonomy, *Sinopimoa* gen. nov., *Sinopimoa bicolor* sp. nov.

### 1 Introduction

The highest number of suprageneric linyphioid taxa is known from Southeast Asia. The tropical Southwest China is the only region in which members of all three families of this araneoid branch are known to occur: Linyphiidae, Pimoidae and Sinopimoidae fam. nov.

The type material of the new taxa was collected by canopy fogging technique (Paarmann & Stork, 1987; Fig. 15) within tropical wet or rainforests. The spiders of this new family may be restricted to rainforests, and may live in higher strata of the vegetation like many members of the related family Linyphiidae, in contrast to members of the family Pimoidae that usually occur on the ground, under stones and in caves.

### 2 Material and Methods

Specimens were examined using an Olympus-SZ11 stereomicroscope and illustrated using an Olympus-BX41 compound microscope equipped with a drawing tube. Male left pedipalpus and female epigynum were illustrated after being separated from the body. Embolic divisions were dissected from the palpal bulb using sharp pins and tweezers. Genital organs were immersed in 75% alcohol and examined under a compound microscope; embolic divisions and vulvae were mounted in Hoyer's Solution and examined in a strong transmitted light against a white background. Abbreviations used in the text and figures: A = sclerotized edge of the retromarginal pit of the cymbium, AT = apophysis of the pedipalpal tibia, E = embolus, L = labium, P = paracymbium, S = subtegulum, T = tegulum, TA = tegular apophysis, U = lumina (free sectors) within the sclerites of the bulbus.

All the types are deposited in the Institute of Zoology, Chinese Academy of Sciences (IZCAS) in Beijing. Type specimen photos of the species included in this paper can be viewed from website <http://www.ChineseSpecies.com> which was created and maintained

by Li & Wang (2007).

### 3 Sinopimoidae fam. nov.

**Etymology.** See *Sinopimoa* gen. nov.

**Diagnosis.** -pedipalpus (Figs. 9-13). Tibia with a large and erect retrobasal outgrowth which is as long as the cymbium; cymbium with a retrolateral pit; paracymbium simple, pointed, only fairly bent, and fused to the cymbium; tegulum with a large and divided apophysis which reaches the pedipalpal patella. Claw of the pedipalpus absent; epigynum/vulva (Figs. 4-7) strongly protruding, with a large and almost half-circled scapus. -Further characters. Dwarf spiders; see the nominate genus.

**Relationships.** Synapomorphies of the linyphioid branch are the cheliceral stridulatory files (Fig. 8), the patellar-tibia autotomy of the legs, the simple paracymbium which is fused to the cymbium, and the free labium which may be ancient characters of the superfamily Araneoidea. According to the combined existence of retrolateral cheliceral stridulatory files, a patellar-tibial kind of autotomy, and a well developed retrobasal paracymbium, Sinopimoidae fam. nov. is a member of the "linyphioid branch" of the superfamily Araneoidea and is related to Linyphiidae and Pimoidae, but it differs strongly from these families by the specialized structures of the -pedipalpus, mainly of the bulb. In the Linyphiidae the paracymbium is a free (movable) sclerite which is strongly bent and blunt. Remarks: 1) in *Linyphia mimonti* Simon, 1884 (Linyphiinae) the paracymbium is strongly reduced and fused to the cymbium; 2) in *Megalepthyphantes* Wunderlich, 1994 (Linyphiinae) a large and erect tibial apophysis of the -pedipalpus evolved convergently to the Sinopimoidae fam. nov. which has also a basal position on the tibia.

In the Pimoidae, in contrast to the Sinopimoidae fam. nov., the cymbium bears cuspules, a "cymbial

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process", and a "pimoid cymbial sclerite", and the embolus bears a "pimoid embolic process". Pimoidae are larger spiders than the Sinopimoidae fam. nov., the fovea is well developed, the leg has more bristles, and the metatarsal bristles exist. The paracymbium is either fused to the cymbium (in *Pimoa* Chamberlin & Ivie, 1943) which is similar to the Sinopimoidae fam. nov. or can be a free sclerite which is attached to the cymbium by a membrane (in *Weintrauboa* Hormiga, 2003).

According to Hormiga (2003: 265) the paracymbium of *Pimoa* "may be secondarily integral", but in respect to its shape (pointed and only weakly bent) we regard the fused paracymbium of *Pimoa* and Sinopimoidae fam. nov. as a basal character of the "linyphoid branch", and the free paracymbium of *Weintrauboa* and Linyphiidae as convergently evolved apomorphic characters. The shape of the paracymbium as well as its connection to the cymbium may be hints that Pimoidae and Sinopimoidae fam. nov. are closely related and probable sister groups. Sinopimoidae fam. nov. is a remarkable mixture of plesiomorphic characters: the simple paracymbium which is fused to the cymbium, plus several other derived patterns: the existence of a free labium, the absence of a claw of the -pedipalpus, the low number of leg bristles, the single pedipalpal stridulatory tooth (these patterns may be the result of dwarfism), the particular pedipalpal tibial apophysis, the retromarginal cymbial pit, and the highly specialized structures of the bulbus.

**Biogeography.** All the three families of the "linyphoid branch" of the superfamily Araneoidea are known from tropical and subtropical regions of Southeast Asia. Pimoidae and Sinopimoidae fam. nov. are completely absent in the Southern Hemisphere. The pattern of this distribution may indicate the origin of the "linyphoid branch" within a (sub) tropical region of Laurasia, most probably Southeast Asia.

Type genus: *Sinopimoa* gen. nov.

**Etymology.** "Sino" = Chinese; "pimoa" indicates to affinities of *Sinopimoa* gen. nov. to the family Pimoidae, especially to the similar paracymbium of its type genus *Pimoa* Chamberlin & Ivie 1943. The gender of the name is feminine.

Type species: *Sinopimoa bicolor* sp. nov.

**Diagnosis.** Bicoloured (Fig. 14) and small spiders, fovea and trichobothrium of metatarsus absent, few leg bristles: metatarsi none, tibiae dorsally 2/2/1/1 and a lateral pair on , femora: only a single prolateral one on . Structures of the genital organs: see above, the family diagnosis.

**Distribution.** Southwestern China.

*Sinopimoa bicolor* gen. nov. et sp. nov. (Figs. 1-14)

**Etymology.** The specific name refers to the bicoloured spider (Latin: *bicolor* of two colours);

adjective.

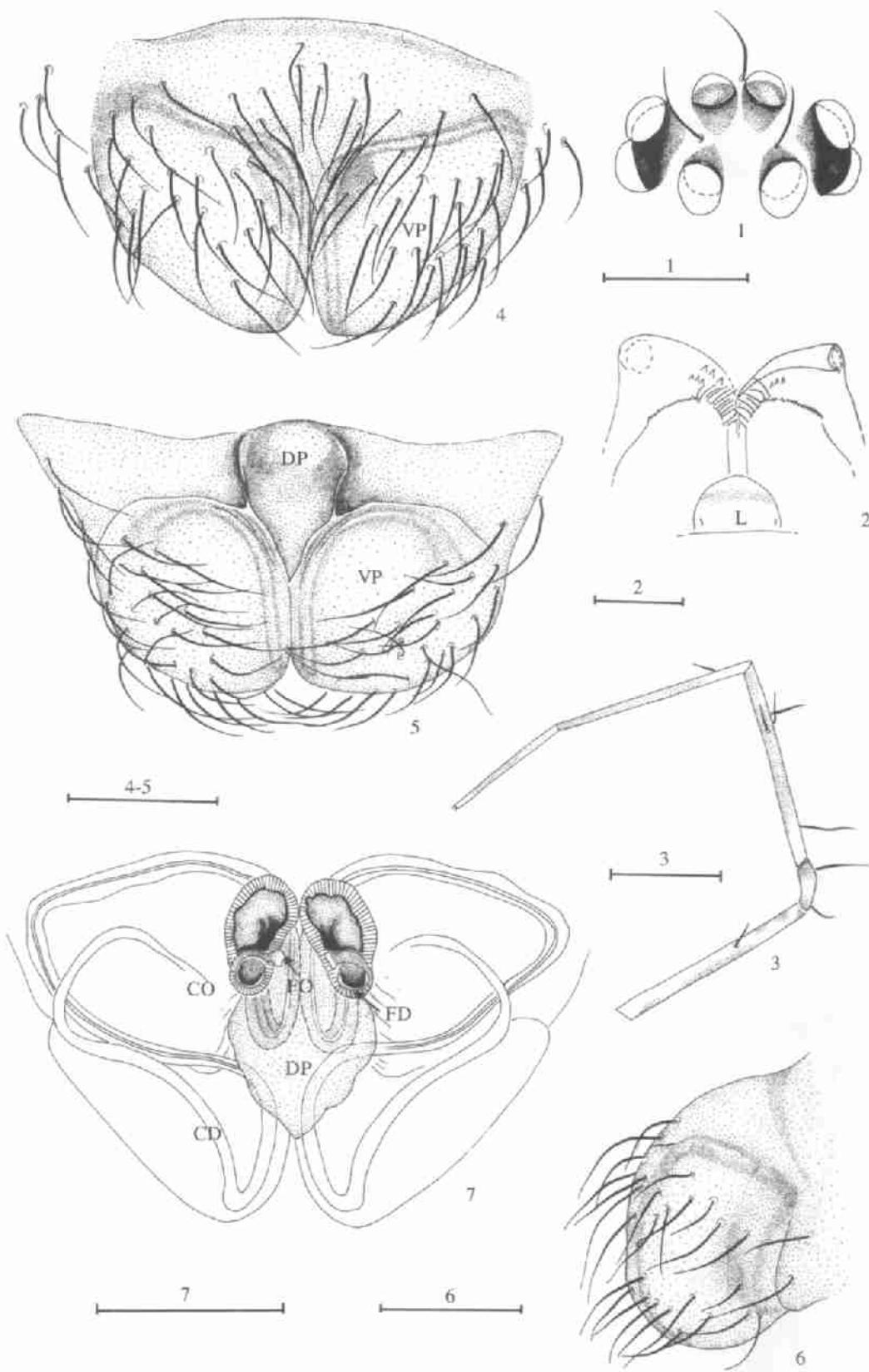
**Material.** Southwestern China, Yunnan Province, Menglun Nature Reserve. Holotype (21°55' N, 101°16' E), secondary tropical rainforest, alt. 598 m ± 17 m above sea-level, 22 July 2007. Paratype 1 (21°54' N, 101°16' E), secondary moist tropical forest, alt. 612 m ± 11 m, 10 Aug. 2007. leg. ZHENG Guo.

**Diagnosis.** Position of the trichobothrium on metatarsus - in 0.17-0.2, tibial apophysis of the -pedipalpus flattened and widened distally (Fig. 9), epigynum/vulva as in Figs. 4-7.

**Description.** Measurements (in mm). Body length 1.2, 1.3, prosomal length 0.47, 0.5, prosomal width 0.43; legs: ( / ): femur 0.72/0.82, patella 0.15/0.18, tibia 0.66/0.8, metatarsus 0.70/0.84, tarsus 0.50/0.56, tibia 0.57/0.47 (the left -tibia is lost), tibia 0.28/0.34, tibia 0.38/0.48, length of the basal tibial bristle 0.17-0.2, width of the eye field 0.25, length of the tibial apophysis of the -pedipalpus 0.2.

Colour (Fig. 14) basically light yellow, prosoma with a pair of wide longitudinal dark brown bands, eye field darkened, sternum medially with a narrow longitudinal stripe, legs partly distinctly darkened, e. g. tibia dark brown except basally, opisthosoma dorsally and laterally darkened like a net-web, ventrally yellow.

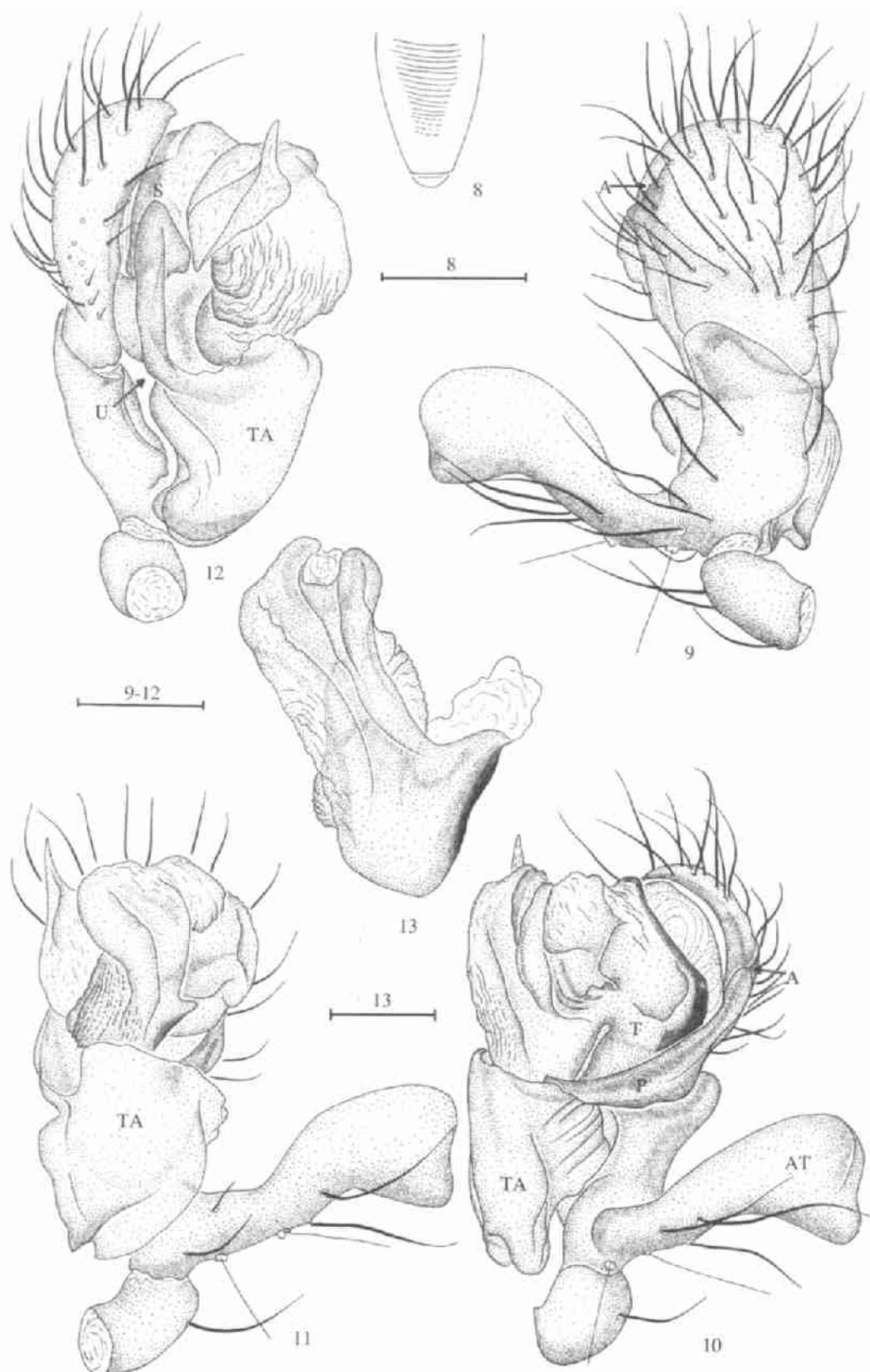
Prosoma (Figs. 1-2, 8, 14) distinctly longer than wide, hairs short, fovea/thoracal ridge absent; eyes large, field almost as wide as the prosoma, posterior row straight, posterior median eyes separated by their diameter, lateral eyes contiguous, clypeus 1 1/2 times longer than the diameter of the anterior median eyes, basal cheliceral articles fairly large, the anterior margin of the cheliceral furrow bears 3 teeth (rarely 2), the posterior margin bears 3 tiny teeth, fangs slender. Numerous retrolateral stridulatory files exist in both sexes. Labium free, wider than long and rebordered, gnathocoxae in an almost parallel position, sternum as wide as tong, coxae separated by their diameter. -pedipalpus with long bristles, femur with a single probasal stridulatory tooth, tarsal claw absent. -Legs (Fig. 3) long and slender, order / / / , articles longer in the female except tibia , autotomy between patella and tibia (the left leg of the female is broken off in this position and lost), bristles are absent on tarsi and metatarsi, femora: only a single prolateral long bristle in the distal half on , sequence of the long dorsal tibial bristles 2/2/1/1, tibia bears an additional pair of long lateral bristles in the distal half. Trichobothria exist on metatarsi - , their position on - is in 0.17-0.20; the tarsi bear 3 small claws. -Opisthosoma 1.35 ( ) to 1.45 ( ) times longer than wide, oval, covered with short hairs, narrow posteriorly; tracheal spiracle small, its position near the spinnerets, the colulus bears 5 hairs in the female, the



Figs. 1-7. *Sinopimoa bicolor* gen. nov. et sp. nov., female. 1. Eyes, dorsal view. 2. Mouth parts, ventral view, with the right fang removed to show the marginal teeth of the cheliceral furrow. 3. Right leg, prolateral view. 4-6. Ventral, lateral and posterior aspect of the epigynum. 7, Dorsal aspect of the vulva. Scale bars: 1, 2, 4-7 = 0.1 mm, 3 = 0.5 mm.

spinnerets are short. - -pedipalpus (Figs. 9-13): Femur slender, bearing a probasal stridulatory tooth, patella

slightly longer than wide, bearing a long dorsal-distal bristle, tibia large, bearing a dorsal trichobothrium in a



Figs. 8-13. *Sinpimoa bicolor* gen. nov. et sp. nov., male. 8. Retrolateral aspect of the distal part of the left chelicera with stridulatory files. 9-12. Dorsal, retrolateral, ventral and prolateral aspect of the left pedipalpus. 13. Ventral aspect of the bulbus. Scale bars: 8-12 = 0.1 mm, 13 = 0.05 mm.

more basal position, and with a long erect retrobasal blunt and flattened apophysis which is widened distally,

cymbium distally with a retromarginal pit which has a sclerotized margin, alveolus large, in a distal position



Fig. 14. *Singpimoa bicolor* gen. nov. et sp. nov. , , habitus , dorsal view (Photo by LIN Yu Cheng and LIU Jie) . Fig. 15. Types were collected in Xishuangbanna Rainforest of Yunnan Province with canopy fogging technique (Photo by ZHENG Guo) .

(Fig. 9) . Strongly sclerotized structures of the bulbus are absent ; the tegulum bears a large two-partite apophysis

which extends up to the pedipalpal patella ; embolus in an almost apical position , difficult to recognize. In the

expanded bulbus the slender part of the tegular apophysis may fit as an "arresting apophysis" into the retromarginal pit of the cymbium. -Epigynum (Figs. 4-6) large and distinctly protruding, not sclerotized, with a long and slender scapus which tip is hidden. Vulva Fig. 7.

Relationships, distribution and ecology. See above.

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## 华模蛛科——采自中国的蜘蛛目一新科(蛛形纲, 蜘蛛目)

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**摘要** 记述了采自我国云南西双版纳雨林的1新科, 华模蛛科 *Sinopimoidae* fam. nov., 1新属, 华模蛛属 *Sinopimoa* gen.

**关键词** 新阶元, 雨林, 分类, 华模蛛属, 双色华模蛛.

**中图分类号** Q969.26

nov., 1新种, 双色华模蛛 *Sinopimoa bicolor* sp. nov.。模式标本保存在中国科学院动物研究所。